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for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

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Request to Enter Into a Contract for Professional Services
To Consolidate the Water Use Reporting Databases into
Structured Query language (SQL) Platform
And Install ArcGIS Server-Based Applications

BACKGROUND

At its inception in 1987, the Commission on Water Resource Management (Commission) has been mandated under the Hawaii Revised Statutes §174C-5 and §174C-43 and Hawaii Administrative Rules §13-168-7 with the legal authority to collect water use reports of well and stream diversion from permitted owners and operators. In the exercise of effective management of our natural water resources, it is important that the Commission acquires and maintains record of all actual withdrawals from our water resources. This step is fundamental in understanding the cumulative stresses imposed upon the ground and surface water resources by well owners and stream diversion managers in the state. It also provides the Commission leverage for informed decisions in its effort to:

- a. Protect and sustain viable sources of ground and surface water in the state;
- b. Promote efficient and environment-compatible withdrawals of water resources;
- c. Provide best available information to resolve water disputes involving ground and surface water.

In compliance to the aforementioned statutory requirements, the Commission approved several initiatives that are foundational to this proposed contract for professional services. As early as August 17, 1988, the Commission approved the first water use reporting forms. These were to be used by the owners of well and stream diversions to record and report their water use. Staff has periodically updated these forms.

From December 1, 1988, the Commission opened and allowed the registration of existing actual wells and stream diversions for a period of one year. This Commission action complemented the provisions of the Hawaii Revised Statutes §174C-26 and Hawaii Administrative Rules §13-168-5 for filing the declaration of water use from well and stream diversion. As such, the Commission's water use declaration process has provided the mechanism for creating an initial inventory of sources for water withdrawals.

On September 1, 1992, the Commission completed the registration of existing sources of wells and stream diversions and their corresponding declared uses through the publication of Declarations of Water Use Volumes 1 & 2, Report C123. This document is a huge resource of information for building the data structure of the state water use reporting system.

On September 16, 1992, the Commission adopted a moderate stance on reporting requirements by allowing limited exemptions, defining appropriate reporting frequency, and deferring some open ditch stream diversion measurements until guidelines and standards are established. With these modified requirements, the Commission set its course on tracking medium to large ground water users. During this time, water use data development bifurcated on separate tracks for groundwater and surface water, and gained momentum on different formats of database. There were several attempts by staff to centralize the recording and retrieval of monthly water use reports, but the efforts to consolidate the ground and surface water databases remain a work in progress to date.

From 2002 to present, staff has sought the assistance the department's data processing division to develop a master database for tracking water use reporting statewide and integrate bulk reports. A working Access-based database is now in use, and constantly being updated with reported water use by county water supply, military and private water systems. Through the Commission's permitting and registration programs, staff estimates about 3,000 ground water wells, tunnels, and shafts, and thus, should have record of water use for each of these sources. Staff is also working with the data processing division to import historical water-use data.

On May 25, 2005, the Commission approved the development of web-based water use reporting and well analysis applications utilizing Geographic Information System. This action set the stage for an eventual transition to automated water-use reporting system and service-oriented GIS applications. The configuration strategy for GIS computing environment is to consolidate existing databases into a common data standard and domain that would enable interoperability and efficient system performance. Existing Access-based database has file size limitation and server connectivity issues that are counterproductive to a shared database environment and service-oriented system architecture. For instance, water-use reports are time-series data, and thus, tend to increase in file sizes through time. Coupled with projected increased compliance from well and stream diversion owners once web-based reporting system is installed, sizes of Access MDB files can technically approach its 2-gigabyte limit. Moreover, Access database has limited capability in establishing simultaneous connections, and can drag the efforts for data versioning and integration, and product generation. By migrating existing Access database to SQL platform, staff is subscribing to more robust relational database management system with greater potential for performing complex analyses and spatial models.

Goals: This database consolidation and ArcGIS Server implementation will establish the data structure for a centralized water use database. The project objectives are:

- a. Increase the ease and efficiency to record, retrieve and archive well and surface water use data, allowing the staff of different branches of the Commission to interoperate in cross-functional areas and tasks;
- b. Implement an enterprise Geographic Information System (GIS), allowing the staff to utilize the full potential and analytical capabilities of geospatial technology.

Additional benefits of consolidated database in SQL platform include:

- a. Basically unlimited file size;
- b. Reduced hardware and system administration cost by eliminating unnecessary data replications and system redundancies;
- c. Greater efficiency of network traffic and connectivity of simultaneous users;
- d. Improved data access and data security.

Scope: Specific work elements of this project include:

- a. Migrating the existing Access-based database of well information, water use reports, and stream diversion reports into SQL Server platform
- b. Perform data conversion, such as data types changes from text to numeric, and tabular link review and maintenance
- c. Creating a reporting system that offers real-time access to reports and water-use information
- d. Creating interfaces for existing GIS facility to enhance the framework for establishing an enterprise GIS applications
- e. Installation of ArcGIS Server for productive operations in desktop mapping, mobile applications, web services, geoprocessing services, and business workflows.

Staff and Inter-agencies Involved: The Survey Branch and Groundwater Regulation Branch will oversee the implementation of this contract. Survey Branch is responsible for data collection and analysis, including the water use reporting, while Groundwater Regulation Branch implements and enforces water use reporting. The Department's Data Processing Office will also be working with the consultant to implement this project. The database will be designed to be hosted in ArcGIS Server, and to meet the existing hardware and network requirements of the project.

Estimated Cost: The estimated cost for this project is not to exceed \$45,000 and shall be subject to the availability funding within the Commission's budget.

The projected time frame of the contracted services: The requested services are to be completed within 6 months from the issuance of a Notice to Proceed. Staff anticipates selecting, negotiating, and entering into final contract agreement within the second quarter of fiscal year 2009.

RECOMMENDATION:


Staff recommends that the Commission authorize the Chairperson to enter into an agreement for professional services to consolidate the water use reporting databases into SQL platform and implement ArcGIS Server-based applications. Final consultant selection and contract execution will be done in accordance with Chapter 103D, Hawaii Revised Statutes and Chapter 3-122, Hawaii Administrative Rules.

Respectfully submitted,



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APPROVED FOR SUBMITTAL:



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